

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460



OFFICE OF AIR AND RADIATION

June 17, 2020

Mr. Marc J. Duquette
Director, Environmental Health and Safety
Carroll County Energy, LLC
155 Federal Street, 17th Floor
Boston, Massachusetts 02110

Re: Petition to use an alternative fuel flowmeter calibration procedure for units 1 and 2 at the Carroll County Energy Center (facility ID (ORISPL) 59773)

Dear Mr. Duquette:

The United States Environmental Protection Agency (EPA) has reviewed the September 12, 2018 petition and subsequent April 1, 2020 email with supporting documentation submitted by Carroll County Energy, LLC (Carroll County Energy) under 40 CFR 75.66(c) requesting approval of an alternative calibration procedure for fuel flowmeters that are being or may be used to measure fuel flow rates at units 1 and 2 at the Carroll County Energy Center (CCEC). EPA approves this petition, with conditions, as discussed below.

Background

Carroll County Energy owns and operates units 1 and 2 at the CCEC in Washington Township, Carroll County, Ohio. CCEC's units 1 and 2 are combined cycle combustion turbines each serving an electricity generator with a reported nameplate capacity of 235.5 megawatts as well as a common steam turbine and electricity generator with a reported nameplated capacity of 361.3 megawatts. The units combust pipeline natural gas. According to Carroll County Energy, units 1 and 2 are subject to the Acid Rain Program and the Cross-State Air Pollution Rule. Carroll County Energy is therefore required to continuously monitor and report sulfur dioxide (SO₂), nitrogen oxides (NO_x), and carbon dioxide (CO₂) mass emissions, NO_x emission rate, and heat input for the units in accordance with 40 CFR part 75.

To meet the SO₂ emissions and heat input monitoring requirements, Carroll County Energy has elected to use the monitoring methodology in appendix D to part 75. Section 2.1 of appendix D requires continuous monitoring of the fuel flow rate to each affected unit using gas and/or oil fuel flowmeters that meet initial certification requirements set forth in section 2.1.5 and ongoing quality assurance requirements set forth in section 2.1.6.

Section 2.1.5 specifies three acceptable ways to initially certify a fuel flowmeter: (1) by design (this option is available for orifice, nozzle, and venturi flowmeters only), (2) by measurement under laboratory conditions using an approved method, or (3) by in-line comparison against a reference meter

that either meets the design criteria in (1) above or that within the previous 365 days has met the accuracy requirements of appendix D by measurement using an approved method under (2) above. Certain approved measurement methods are listed in section 2.1.5.1. However, the section provides that unlisted methods using equipment traceable to National Institute of Standards and Technology (NIST) standards may also be used, subject to EPA approval pursuant to a petition submitted under § 75.66(c). Section 2.1.6 generally allows ongoing quality assurance tests to be carried out using the same methods as section 2.1.5.

CCEC units 1 and 2 are being equipped with Coriolis fuel flowmeters manufactured by Emerson Process Management – Micro Motion, Inc. (Emerson MMI) to measure fuel flow. Two fuel flowmeters (model CMFHC2M452N2BAEZZX, serial numbers 12128898 and 12129487) will be used to measure the flow of pipeline natural gas. Carroll County Energy also anticipates the possibility of using additional like-kind fuel flowmeters at units 1 and 2 in the future. Each individual flowmeter must meet the initial certification requirements set forth in section 2.1.5 of appendix D and the ongoing quality assurance requirements set forth in section 2.1.6.

Emerson MMI has developed a calibration procedure it calls the Transfer Standard Method (TSM). According to Emerson MMI, the TSM uses equipment that is traceable to NIST standards. According to the Carroll County Energy petition, each flowmeter identified above has been tested for initial certification using the Emerson MMI TSM and will be calibrated for ongoing quality assurance purposes using the same method.

Coriolis flowmeters are not orifice, nozzle, or venturi flowmeters and therefore do not qualify for certification based on their design. Further, the Emerson MMI TSM is not listed in section 2.1.5.1 of appendix D as an approved method. However, EPA has previously evaluated and approved the use of the Emerson MMI TSM as an alternative certification and quality assurance testing method for Coriolis flowmeters at other facilities. In view of these circumstances, Carroll County Energy submitted a petition to EPA under § 75.66(c) requesting approval of the use of the Emerson MMI TSM as an alternative certification and quality assurance testing method for Coriolis flowmeters at the CCEC. Carroll County Energy requests approval to use the Emerson MMI TSM process not only for the flowmeters identified by the serial numbers above but also for additional like-kind Coriolis fuel flowmeters that Carroll County Energy may use at the facility in the future.

EPA's Determination

EPA has reviewed the information provided by Carroll County Energy in the September 12, 2018 petition. The petition describes the alternative calibration procedure that Carroll County Energy requests approval to use to verify the accuracy of the natural gas fuel flowmeters installed on units 1 and 2 and any other like-kind Coriolis fuel flowmeters to be installed at the CCEC.

EPA approves use of the Emerson MMI TSM calibration procedure for initial certification of the fuel flowmeters (serial numbers 12128898 and 12129487) installed on CCEC units 1 and 2. The basis for this approval is as follows:

A1. The alternative calibration methodology used equipment traceable to NIST standards. In Emerson MMI's TSM, the candidate fuel flowmeter to be tested for accuracy is calibrated against a reference meter that was calibrated against a "Global Reference Meter" which, in turn, was calibrated using Micro Motion's "Primary Flow Stand." The Primary Flow Stand is an ISO 17025-accredited calibration system that uses equipment traceable to NIST standards. Thus, the

reference meters used to test CCEC's flowmeters had fully traceable calibrations through an accredited path back to NIST standards.¹

A2. The calibration procedure followed for initial certification of CCEC's flowmeters met the requirements of section 2.1.5.2(a) of appendix D to part 75 for in-line testing of a candidate flowmeter by comparison against a reference flowmeter. Specifically:

- a. The reference flowmeters and secondary elements (i.e., temperature transmitters and pressure transducers) used to test CCEC's flowmeters had been calibrated within 365 days prior to the comparison testing;
- b. The comparison testing was performed in a laboratory over a period of less than seven operating days; and
- c. For the candidate flowmeter, three test runs were conducted at each of three flow rate levels with each test run lasting 20 minutes in duration.

A3. At each tested flow rate level, the fuel flowmeters demonstrated accuracy better than the accuracy requirement specified in section 2.1.5 of appendix D – 2.0 percent of the flowmeter's upper range value (URV). The test results are summarized in Table 1 below.

Table 1 – Average three-run natural gas fuel flowmeter accuracy results

| Flow rate level | Flowmeter s/n 12128898 Accuracy (% of URV) | Flowmeter s/n 12129487 Accuracy (% of URV) |
|---|---|---|
| Normal minimum unit operating load | 0.022% | 0.002% |
| Mid unit operating load | 0.037% | 0.008% |
| Normal full unit operating load | 0.078% | 0.058% |

EPA also approves the use of the Emerson MMI TSM calibration procedure to meet the applicable ongoing quality assurance requirements for the fuel flowmeters installed on CCEC units 1 and 2 under section 2.1.6 of appendix D, subject to the following conditions:

B1. The application of the Emerson MMI TSM for each future accuracy test must meet the requirements of section 2.1.5.2(a) of appendix D as part of the basis for EPA's approval of use of the TSM for the initial certification of the fuel flowmeters; and

B2. The three flow rate levels tested in each future accuracy test must correspond to: (1) normal full unit operating load, (2) normal minimum unit operating load, and (3) a load point approximately equally spaced between the full and minimum unit operating loads.

EPA further approves the use of the Emerson MMI TSM calibration procedure to meet the applicable initial certification and ongoing quality assurance requirements for like-kind Coriolis fuel flowmeters used in the future at the CCEC subject to the satisfaction, for each such like-kind fuel flowmeter, of all approval conditions set forth in paragraphs (A1), (A2), (A3), (B1), and (B2) of this approval for the fuel flowmeters identified by serial numbers above.

¹ The Primary Flow Stand calibration system is equipment that has been accredited by NVLAP according to ISO 17025.

EPA's determination relies on the accuracy and completeness of the information provided by Carroll County Energy and is appealable under 40 CFR part 78. If you have any questions regarding this determination, please contact Louis Nichols at (202) 343-9008 or by e-mail at nichols.louis@epa.gov. Thank you for your continued cooperation.

Sincerely,

Reid P. Harvey

Reid P. Harvey, Director
Clean Air Markets Division

cc: Louis Nichols, U.S. EPA
Michael Compher, U.S. EPA, Region 5
Todd Brown, Ohio EPA